

## AMENDMENTS TO THE SPECIFICATION

***a) Paragraph at page 1 starting at line 11 and ending at line 16:***

This application is a continuation application claiming the benefit of priority under 35 U.S.C. § 120 of co-pending patent application 09/276,595, filed March 25, 1999, which claims priority to ~~is based on~~ U.S. Provisional Application Serial No. 60/079,312, filed March 25, 1998, the contents of ~~which~~ each of these applications are hereby incorporated by reference into this application. This invention was made with government support under grants CA-28824, HL-25848 and AI-16943 from the National Institutes of Health. Additionally, the present invention was supported in part by a fellowship from the United States Army to Scott Kuduk (DAMD 17-98-1-8154). Accordingly, the U.S. Government has certain rights in the invention.

***b) Paragraph on page 6, starting at line 32 and ending at line 33:***

Figure 6 shows the synthesis of  $\alpha$ -O-linked glycopeptide conjugates (SEQ ID: 1) of the Le<sup>y</sup> epitope via an iodosulfonamidation/4+2 route.

***c) Paragraph on page 6, starting at line 35 and ending at line 36:***

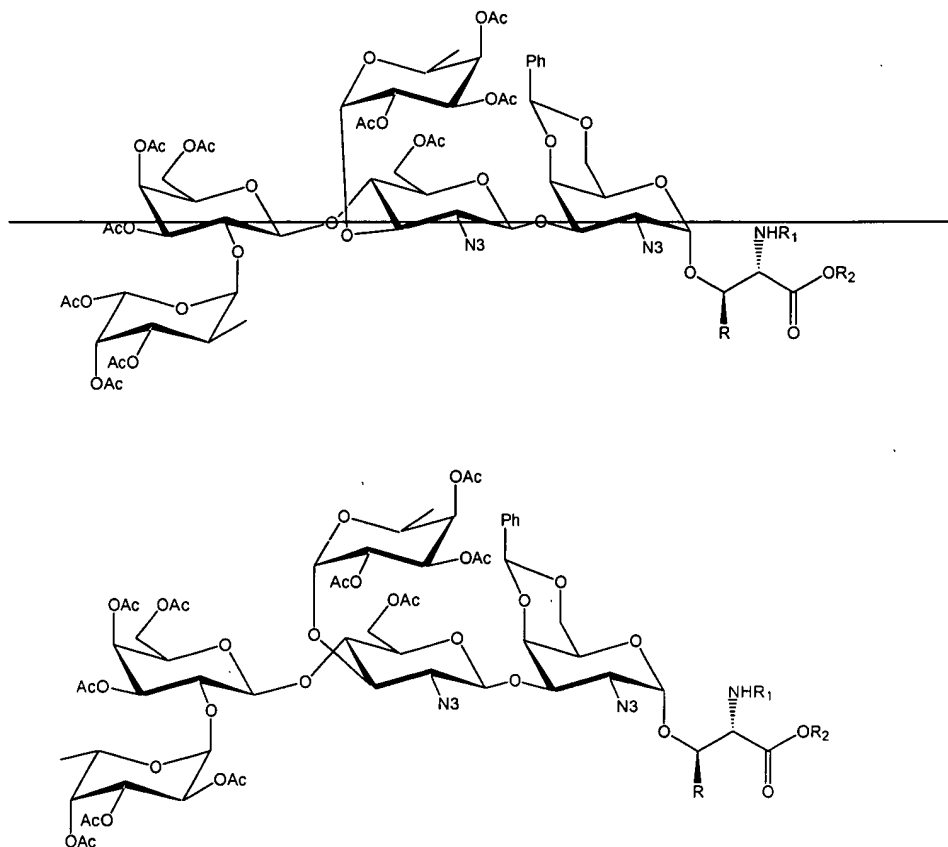
Figure 7 provides the synthesis of  $\alpha$ -O-linked glycopeptide conjugates (SEQ ID: 1) of the Le<sup>y</sup> epitope via an azidonitration/4+2 route.

***d) Paragraph at page 20 starting at line 17 and ending at line 20:***

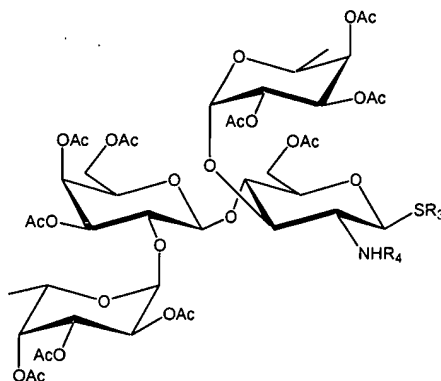
Methods for preparing carbohydrate domains based on a solid-phase methodology have been disclosed in U.S. Serial Nos. 08/213,053 and 08/430,355, now Patent Nos. 5,543,505 and 5,708,163, respectively, and in PCT International Application No. PCT/US96/10229, the contents of which are incorporated by reference.

***e) Paragraph starting on page 31 line 16 and ending on page 32 line 34:***

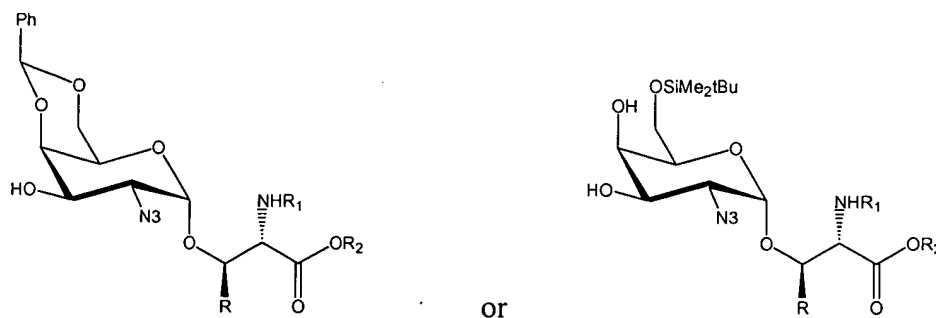
The present invention also provides a method of preparing a protected O-linked Le<sup>y</sup> glycoconjugate having the structure:



wherein R is hydrogen, linear or branched chain lower alkyl, or optionally substituted aryl; R<sub>1</sub> is t-butyloxycarbonyl, fluorenylmethylenecoxycarbonyl, linear or branched chain lower alkyl or acyl, substituted benzyl or aryl; R<sub>2</sub> is a linear or branched chain lower alkyl, or optionally substituted benzyl or aryl; and ~~R<sub>4</sub> is hydrogen, linear or branched chain lower alkyl or acyl, optionally substituted aryl or benzyl; or optionally substituted aryl sulfonyl;~~ which comprises coupling a tetrasaccharide sulfide having the structure:



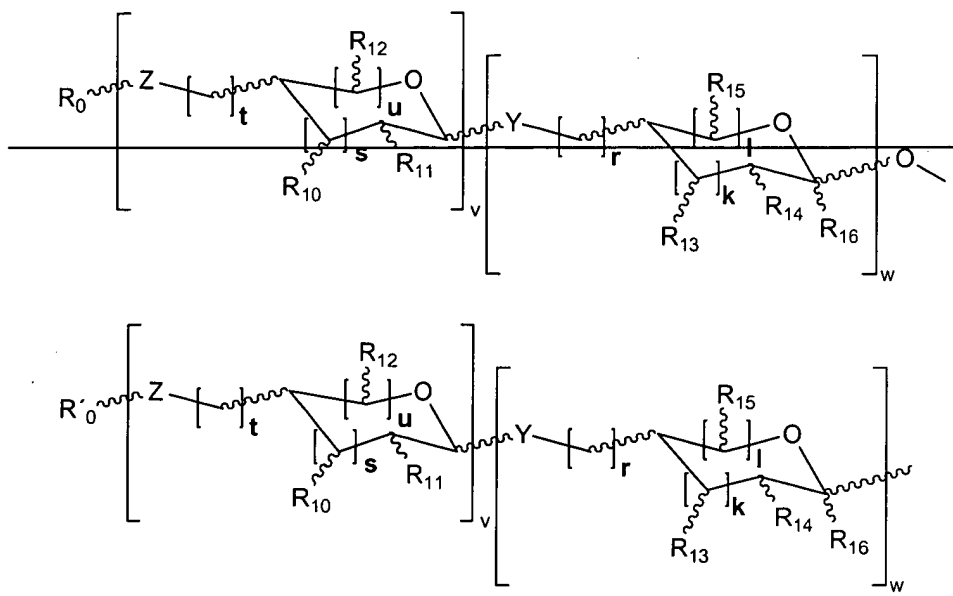
wherein R<sub>3</sub> is linear or branched chain lower alkyl or aryl; and R<sub>4</sub> is hydrogen, linear or branched chain alkyl or acyl, optionally substituted aryl or benzyl; or optionally substituted aryl sulfonyl; with an O-linked glycosyl amino acyl component having the structure:



under suitable conditions to form the protected O-linked Le<sup>y</sup> glycoconjugate.

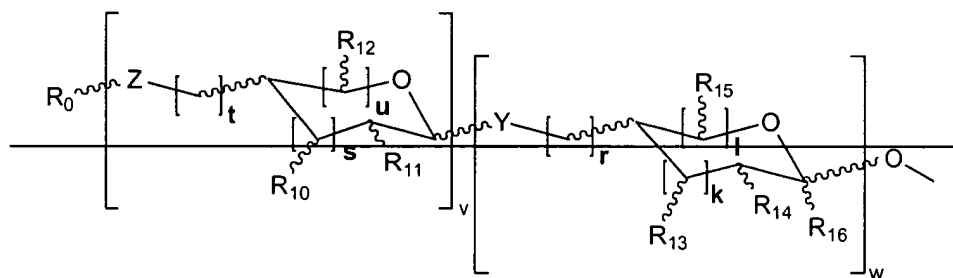
**f) Paragraphs**

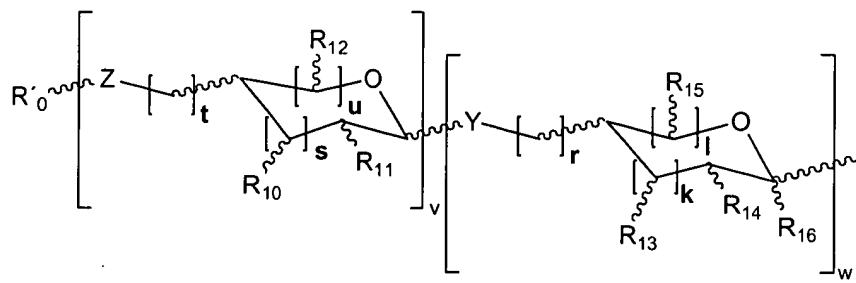
- (i) on page 11 starting at line 11 and ending at line 22;**
- (ii) on page 19 starting at line 1 and ending at line 13;**
- (iii) on page 26 starting at line 12 and ending at line 24;**



wherein Y and Z are independently NH or O; wherein k, l, r, s, t, u, v and w are each independently 0, 1 or 2, wherein R<sub>0</sub>' is hydrogen, a linear or branched chain alkyl, acyl, arylalkyl or aryl group; wherein R<sub>10</sub>, R<sub>11</sub>, R<sub>12</sub>, R<sub>13</sub>, R<sub>14</sub> and R<sub>15</sub> are each independently hydrogen, OH, OR<sup>iii</sup>, NH<sub>2</sub>, NHCOR<sup>iii</sup>, F, CH<sub>2</sub>OH, CH<sub>2</sub>OR<sup>iii</sup>, or a substituted or unsubstituted linear or branched chain alkyl, (mono-, di- or tri)hydroxyalkyl, (mono- di- or tri-)acyloxyalkyl, arylalkyl or aryl group; wherein R<sub>16</sub> is hydrogen, COOH, COOR<sup>ii</sup>, CONHR<sup>ii</sup>, a substituted or unsubstituted linear or branched chain alkyl or aryl group; wherein R<sup>iii</sup> is hydrogen, CHO, COOR<sup>iv</sup>, or a substituted or unsubstituted linear or branched chain alkyl, arylalkyl or aryl group; and wherein R<sup>ii</sup> and R<sup>iv</sup> are each independently H, or a substituted or unsubstituted linear or branched chain alkyl, arylalkyl or aryl group.

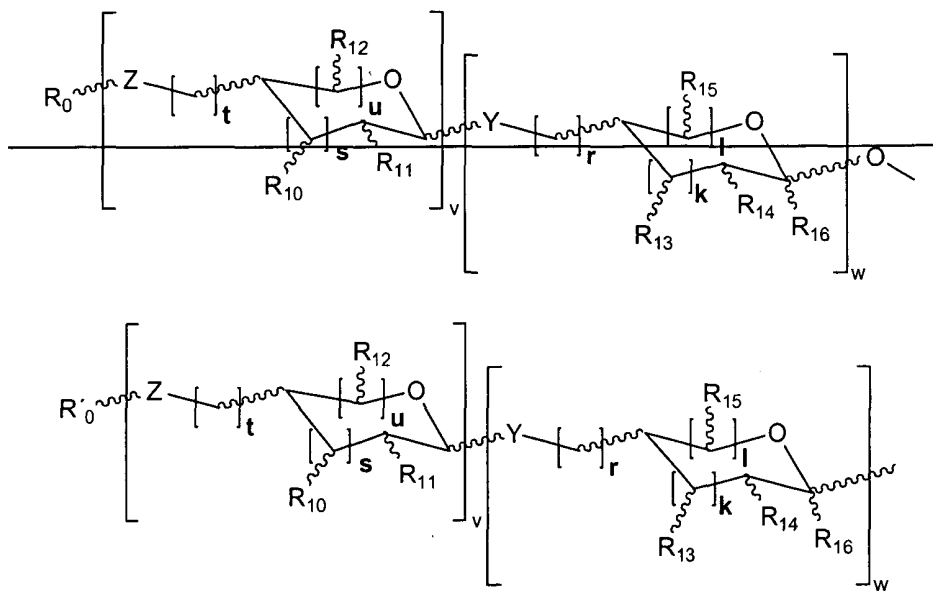
***g) Paragraph on page 17 starting at line 1 and ending at line 21:***





wherein Y and Z are independently NH or O; wherein k, l, r, s, t, u, v and w are each independently 0, 1 or 2, wherein R'0 is hydrogen, a linear or branched chain alkyl, acyl, arylalkyl or aryl group; wherein R10, R11, R12, R13, R14 and R15 are each independently hydrogen, OH, OR<sup>iii</sup>, NH2, NHCOR<sup>iii</sup>, F, CH2OH, CH2OR<sup>iii</sup>, or a substituted or unsubstituted linear or branched chain alkyl, (mono-, di- or tri)hydroxyalkyl, (mono- di- or tri-)acyloxyalkyl, arylalkyl or aryl group; wherein R16 is hydrogen, COOH, COOR<sup>ii</sup>, CONHR<sup>ii</sup>, a substituted or unsubstituted linear or branched chain alkyl or aryl group; wherein R<sup>iii</sup> is hydrogen, CHO, COOR<sup>iv</sup>, or a substituted or unsubstituted linear or branched chain alkyl, arylalkyl or aryl group; and wherein R<sup>ii</sup> and R<sup>iv</sup> are each independently H, or a substituted or unsubstituted linear or branched chain alkyl, arylalkyl or aryl group. In a certain embodiment, the present invention provides the above-shown glycoconjugate wherein at least one carbohydrate domain has the oligosaccharide structure of a cell surface epitope. In one embodiment, the epitope is Le<sup>a</sup>, Le<sup>b</sup>, Le<sup>x</sup>, or Le<sup>y</sup>. In another embodiment, the epitope is MBr1, a truncated MBr1 pentasaccharide or a truncated MBr1 tetrasaccharide. in a particular embodiment, the invention provides the glycoconjugate shown above wherein one or more of R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14 and R15 is 1RS,2RS,3-trihydroxy-propyl.

***h) Paragraph starting on page 21 line 17 and ending on page 22:***

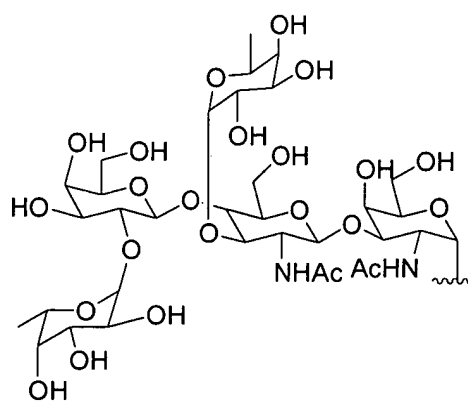
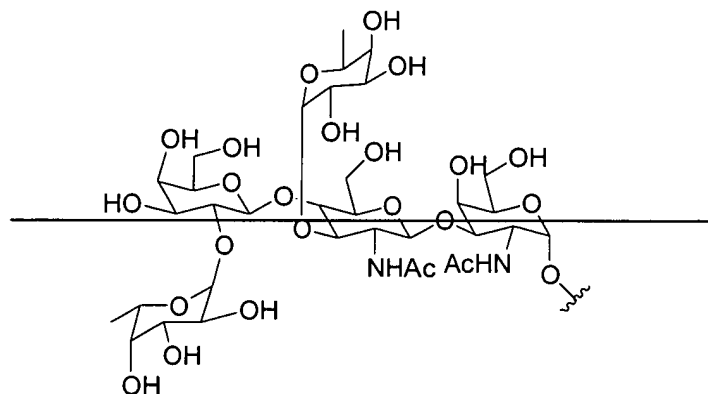


wherein Y and Z are independently NH or O; wherein k, l, r, s, t, u, v and w are each independently 0, 1 or 2, wherein  $R'_0$  is hydrogen, a linear or branched chain alkyl, acyl, arylalkyl or aryl group; wherein  $R_{10}$ ,  $R_{11}$ ,  $R_{12}$ ,  $R_{13}$ ,  $R_{14}$  and  $R_{15}$  are each independently hydrogen, OH,  $OR^{iii}$ ,  $NH_2$ ,  $NHCOR^{iii}$ , F,  $CH_2OH$ ,  $CH_2OR^{iii}$ , or a substituted or unsubstituted linear or branched chain alkyl, (mono-, di- or tri)hydroxyalkyl, (mono- di- or tri-)acyloxyalkyl, arylalkyl or aryl group; wherein  $R_{16}$  is hydrogen, COOH,  $COOR^{ii}$ ,  $CONHR^{ii}$ , a substituted or unsubstituted linear or branched chain alkyl or aryl group; wherein  $R^{iii}$  is hydrogen, CHO,  $COOR^{iv}$ , or a substituted or unsubstituted linear or branched chain alkyl, arylalkyl or aryl group; and wherein  $R^{ii}$  and  $R^{iv}$  are each independently H, or a substituted or unsubstituted linear or branched chain alkyl, arylalkyl or aryl group. In a certain embodiment, the invention provides a glycoconjugate wherein  $R_v$ ,  $R_w$ ,  $R_x$  and  $R_y$  are methyl.

***i) Paragraphs (structures):***

***(i) on page 22, lines 20-25; and***

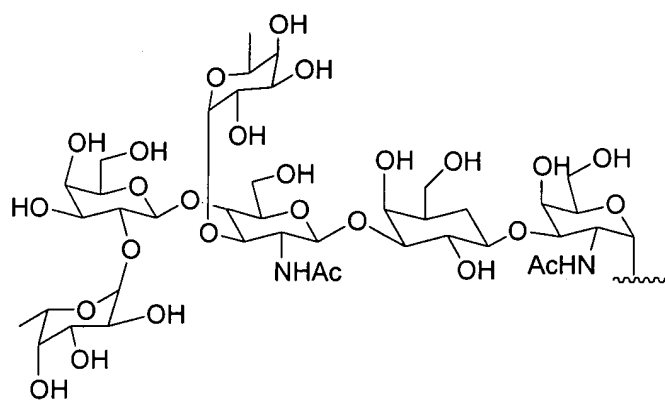
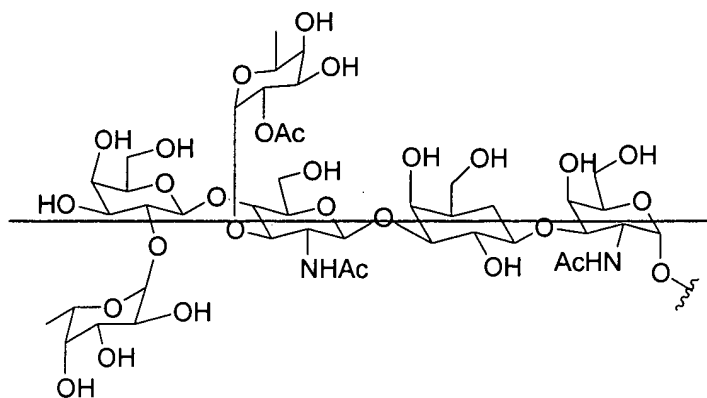
***(ii) on page 28, the first structure starting at line 5***



***j) Paragraphs (structures):***

***(i) on page 23, lines 1-9; and***

***(ii) on page 27, starting at line 20 to the end of the page;***

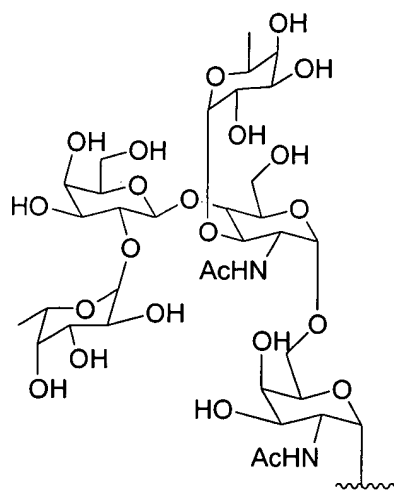
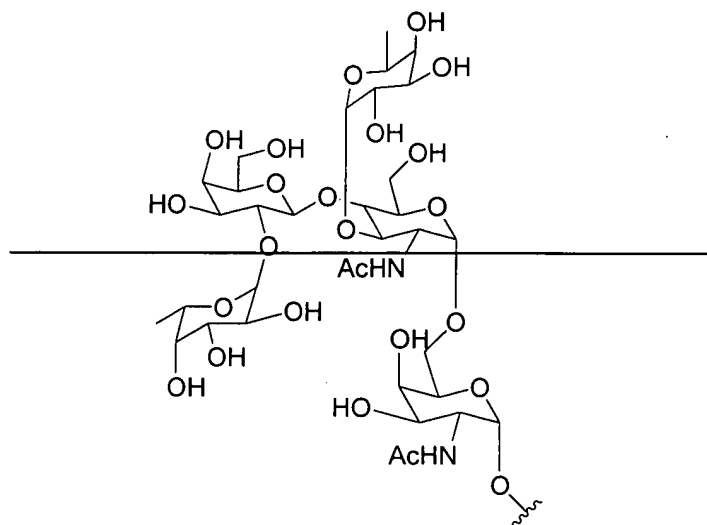


***k) Paragraphs (structures):***

***(i) on page 23, line 11 to line 25; and***

***(ii) on page 28, the second structure;***

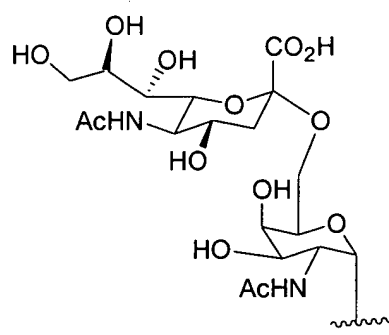
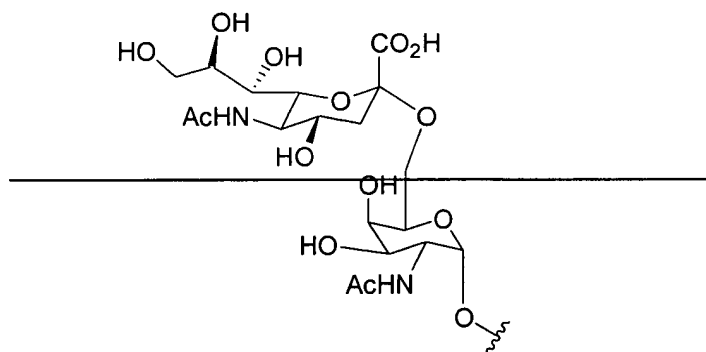




***l) Paragraphs (structures):***

***(i) on page 24, lines 1-4; and***

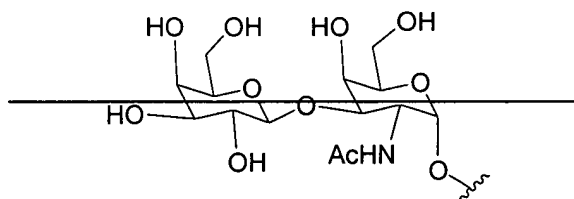
***(ii) on page 29, first structure;***

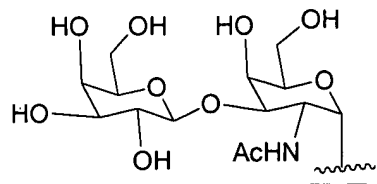


***m) Paragraphs (structures):***

***(i) on page 29, second structure; and***

***(ii) on page 24, second structure;***

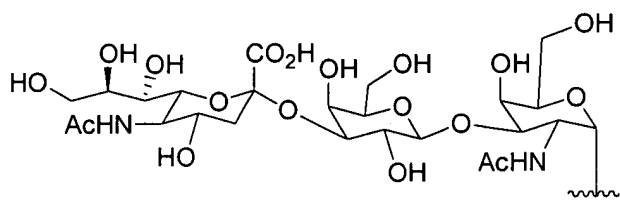
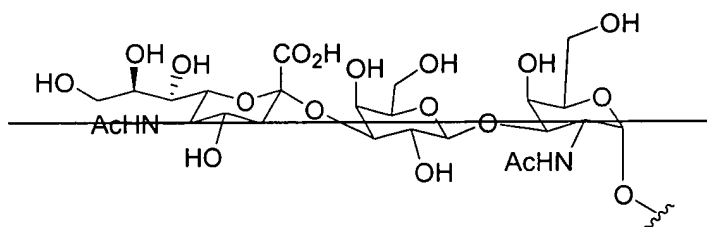




*n) Paragraphs (structures):*

*(i) on page 24, third structure; and*

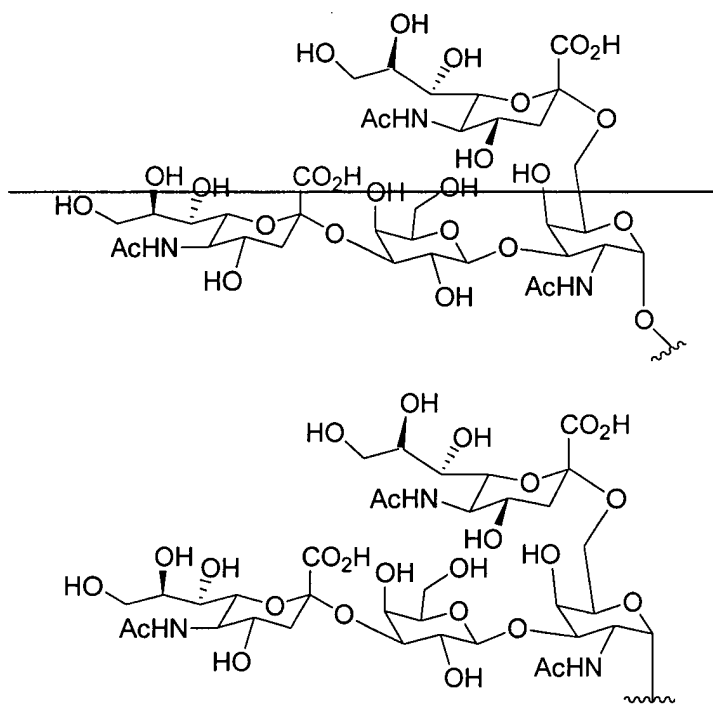
*(ii) on page 29, third structure;*



*o) Paragraphs (structures):*

*(i) on page 24, fourth structure; and*

*(ii) on page 29, fourth structure;*



*p) Paragraphs (structures):*

*(i) on page 25, first structure; and*

*(ii) on page 30, first structure;*

